

Twenty seven plants species have been studied. Roots of three plants (*Berberis lycium*, *Mallotus philippensis* and *Ziziphus nummularia*) were studied for antineoplastic activity against p53 deficient human leukemia cell lines (HL-60). Roots extract of *Ziziphus nummularia* did not showed activity. Roots of *Berberis lycium* (BuOH fraction) and *Mallotus philippensis* (Hexane fraction) have shown good anti proliferation activity against HL-60 cell lines.

Antineoplastic activity of *Berberis lycium*:

BuOH, EtOAc and H₂O fractions of *Berberis lycium* roots were analyzed for its chemical constituents through thin layer chromatography and reverse phase high performance liquid chromatography. Berberine and palmatine have been detected in the samples. The calculated berberine content was 18.04 %, 0.54 % and 2.76 % and palmatine content was 2.80 %, 0.04 % and 0.93 % in the BuOH, EtOAc and H₂O extracts, respectively. To evaluate which of the major constituents of the BuOH extract may have caused growth inhibition, HL-60 cells were treated with the measured equivalent concentrations of berberine (0.6-1.8 µg/ml) and palmatine (0.3-0.7 µg/ml). The IC₅₀ for berberine was 1.2 µg/ml after 48 h. Palmatine did not inhibit cell growth after 48 h. The inhibition of HL-60 proliferation that was observed upon treatment with BuOH extract or berberine was preceded by the induction of p21^{waf} and by a dramatic down regulation of the proto-oncogene cyclin D1 after 48 h. BuOH extract and berberine caused a reduction of G1 cells and accumulation of cells in the S phase during cell cycle and caused a similar proapoptotic effect by acetylation of α-tubulin, which is indicative for tubulin polymerization. Tilting the fine-tuned equilibrium of polymerized/de-polymerized microtubule is incompatible with normal cell division and this causes not only cell cycle arrest but also apoptosis.

Antineoplastic activity of *Mallotus philippensis*:

The inhibition of HL-60 cells proliferation that was observed upon treatment with hexane extract of *Mallotus philippensis* was preceded by the down regulation of the proto-oncogene Cdc25A and cyclin D1 after 48 h. The hexane fraction induced apoptosis 18% after 48h of treatment with 1.5 mg dry roots equivalent /ml medium. I monitored the ability of *M. philippensis* hexane fraction and the observation indicates that the anti-neoplastic effects have been triggered by induction apoptosis through caspase-2 activation. Hexane fraction of *M. philippensis* analyzed with GC/MS and it has been

detected different compounds in the fraction. Mass spectrometric data of some compounds have been co-related with already reported compounds from different parts of the same species. Unknown compound (GC R_f = 39.9, 45.66, 43.905 and 47.735 minutes respectively) have been detected. It has been confirmed from the present antineoplastic assay that hexane fraction is active against p53 deficient human leukemia cell lines (HL-60) and the activity was due to compound/compounds other than rottlerin.

Total Phenolics, Free radical scavenging activities and Flavonoids finger printing:

Twenty four plant species were studied for total Phenolics, free radical scavenging activities and flavonoids finger printings. Out of twenty four, eighteen plants species have medicinal importance, which includes *Bauhinia variegata*, *Cassia fistula*, *Bombax ceiba*, *Calotropis procera*, *Carissa opaca*, *Adhatoda vasica*, *Albizia lebbeck*, *Colebrookea oppositifolia*, *Dalbergia sissoo*, *Dodonaea viscosa*, *Ficus palmata*, *Ficus racemosa*, *Lantana camara*, *Melia azedarach*, *Phyllanthus emblica*, *Punica granatum*, *Rubus ellipticus* and *Viburnum cotinifolium* and the remaining six species, *Jasminum humile*, *Olea ferruginea*, *Pinus roxburghii*, *Pyrus pashia*, *Caryopteris grata* and *Debregeasia salicifolia* were randomly selected. *Phyllanthus emblica* has shown highest amount of total Phenolics. Gallic acid was used as standard Phenolic compounds. *Pyrus pashia* has shown highest amount of total Phenolics among the randomly selected plant species.

Rubus ellipticus has shown comparatively highest capacity in scavenging free radicals. Its activity was strong than standards ascorbic acid. Flavonoids finger printing of the plant samples have shown the presence of Vitexin, Rutin and Apigenin for the first time in *Rubus ellipticus*; Orientin in *Bauhinia variegata*; Orientin in *Caryopteris grata*; Kamferol-7-neohesperidoside in *Colebrookea oppositifolia*; Vitexin in *Phyllanthus emblica*; Isovitexin in *Melia azedarach*; Vitexin, Isovitexin and Rutin in *Ficus racemosa*; Rutin and Apigenin in *Dodonaea viscosa*; Kaempferol, Vitexin and Hyperoside in *Jasminum humile*; Vitexin, Hyperoside and Rutin in *Albizia lebbeck*; Kaempferol and Isovitexin in *Pinus roxburghii*; Vitexin, Isovitexin and Apigenin in *Olea ferruginea*; Kaempferol, Vitexin and Kamferol-7-neohesperidoside in *Bombax ceiba*; Vitexin and Isovitexin in *Cassia fistula*; Kaempferol and Vitexin in *Lantana camara*; Vitexin and Myricetin in *Punica granatum*; Orientin and Isovitexin in *Pyrus pashia*.; Orientin and Isovitexin in *Dalbergia sissoo*; Luteolin, Orientin and Isovitexin in *Debregeasia Salicifolia*; Orientin and Isovitexin in *Adhatoda vasica*; Vitexin, Orientin, Rutin and Isovitexin in *Carissa opaca*; Vitexin and Isovitexin in *Viburnum cotinifolium*; Vitexin,

Orientin, Rutin and Isovitexin in *Ficus palmata*; Vitexin and Isovitexin in *Calotropis procera*. All plants species have shown Phenolic acids bands. Vitexin and Isovitexin were present in maximum numbers of plants samples (58.33 and 54.8 % percent), Catechin, Luteolin-7-glucoside, Quercetin and Luteolin were not detected in any sample.

Antibacterial and Free radical scavenging activities of *Mallotus philippensis*:

Kamala, a red powder found on the surface of *Mallotus philippensis* has been comparatively studied with roots extract of *Mallotus philippensis* for antibacterial activity and aerial parts of *Mallotus philippensis* for free radical scavenging activity. Kamala extract has shown activities against Gram positive bacteria, *Bacillus subtilis* and *Staphylococcus aureus* (MICs 0.7 and 0.6 mg/ml), while it did not showed any response against the remaining bacterial strains up to maximum concentration of 15 mg/ml. Roots extract was effective against one Gram positive bacteria *Bacillus subtilis* and one Gram negative bacteria *Salmonella setubal* (MICs 1.00 and 2.00 mg/ml) respectively but it did not showed any activity against the remaining bacterial strains up to maximum concentration of 15 mg/ml. It has been concluded that there are difference in chemical composition between the roots and Kamala powder that inhibit bacterial strains in two different ways. The leaves extract was more active than Kamala powder in scavenging free radicals. Flavonoids finger printing of the leaves have shown the presence of vitexin, isovitexin and rutin. It has been confirmed from the present investigation that flavonoids of the leaves of *Mallotus philippensis* are more active than the flavonoids of kamala in scavenging the free radical.

Future Prospect

- In summary, the work done was much significant.
- *Berberis lycium* was the most active medicinal plants and can be used for the treatment of various infectious deceases. However the amount use in crude form must be carefully studied.
- The alkaloids of *Berberis lycium* are much active and therefore need a comprehensive study regarding its side effect.
- Hexane soluble fraction of *Mallotus philippensis* (roots) contain very active compounds which still need to be explore.
- *Rubus ellipticus* contain strong anti oxidant compounds and therefore the plant is strongly recommended for further biological activities.